

In Exercises 17–20, sketch the region whose signed area is represented by the definite integral, and evaluate the integral using an appropriate formula from geometry, where needed.

17. (a) $\int_0^3 x \, dx$

(b) $\int_{-2}^{-1} x \, dx$

(c) $\int_{-1}^4 x \, dx$

(d) $\int_{-5}^5 x \, dx$

18. (a) $\int_0^2 (1 - \frac{1}{2}x) \, dx$

(b) $\int_{-1}^1 (1 - \frac{1}{2}x) \, dx$

(c) $\int_2^3 (1 - \frac{1}{2}x) \, dx$

(d) $\int_0^3 (1 - \frac{1}{2}x) \, dx$

19. (a) $\int_0^3 2 \, dx$

(b) $\int_0^\pi \cos x \, dx$

(c) $\int_{-1}^2 |2x - 3| \, dx$

(d) $\int_{-1}^1 \sqrt{1 - x^2} \, dx$

20. (a) $\int_{-10}^{-5} 6 \, dx$

(b) $\int_{-\pi/3}^{\pi/3} \sin x \, dx$

(c) $\int_0^3 |x - 2| \, dx$

(d) $\int_0^2 \sqrt{4 - x^2} \, dx$

21. Use the areas shown in the accompanying figure to find

(a) $\int_a^b f(x) \, dx$

(b) $\int_b^c f(x) \, dx$

(c) $\int_a^c f(x) \, dx$

(d) $\int_a^d f(x) \, dx.$